

# **PLUG CONNECTOR FOR USE IN STANDARD TRANSFER**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

5           The present invention relates to a plug connector and, more particularly to a plug connector for use in being transferred as different standards.

### **2. Description of the Related Art**

          Referring to FIGS. 1A and 1B, a conventional plug connector has a portion electrically connected to a plurality of conductive lines. The plug  
10   connector can be applied for the connection of a computer or a telephone. The plug connector includes an insulating housing 10a, a tongue element 11a for providing a hooking function and a plurality of terminals 12a arranged within the insulating housing 10a. The terminals 12a can be longitudinally moved a short distance. When the conductive lines 20a are connected to the plug  
15   connector, the conductive lines 20a can be inserted from the rear end of the insulating housing 10a. The conductive lines 20a can be extended into the insulating housing 10a, and the outer layer of the conductive lines 20a can be pierced by the terminals 12a, so that the terminals 12a and the conductive lines 20a will achieve an electrical connection.

20           However, the conventional plug connectors respectively have different standards, i.e. two insulating housings 10a respectively have a width "a" and "b" (shown in FIGS. 1A and 1B). The size of each insulating housing 10a is constant, and thus the conventional plug connector can only adapt to one standard. Each insulating housing 10a fails to adapt simultaneously to two

standards, such as six pins and eight pins. Furthermore, when a factory owner needs to manufacture different standards of plug, and he must renew the molding to manufacture different size of insulating housing, thereby raising manufacturing costs.

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## **SUMMARY OF THE INVENTION**

It is therefore a principal object of the present invention to provide a plug connector for use in a standard transfer, which can make an insulating housing with uniform size be transferable to two standards, so that the manufacturing cost thereof can be effectively reduced, and it is extremely simple and easy to obtain the standard transfer. Furthermore, the present invention has been accomplished to eliminate the aforesaid problem.

In order to achieve the above object, a plug connector for use in a standard transfer includes an insulating housing, a plurality of terminals and a transferring element. The insulating housing has a plurality of terminal grooves formed in a front end thereof. The terminals are respectively arranged in the terminal grooves. The transferring element is coupled on the insulating housing, and the transferring element is moveably adjusted at a predetermined position on the insulating housing due to the standard transfer.

To provide a further understanding of the invention, the following detailed description illustrates embodiments and examples of the invention, this detailed description being provided only for illustration of the invention.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

The drawings included herein provide a further understanding of the invention. A brief introduction of the drawings is as follows:

FIG. 1A is a perspective view of a plug connector of a prior art;

5        FIG. 1B is a perspective view of a plug connector with another standard of the prior art;

FIG. 2 is an exploded perspective view of a plug connector of a first embodiment of the present invention;

10       FIG. 3 is a perspective view of the plug connector of the first embodiment of the present invention;

FIG. 4 is a perspective view of the plug connector of the first embodiment of the present invention while a using condition;

FIG. 5 is a perspective view of the plug connector of the first embodiment of the present invention while using another using condition;

15       FIG. 6 is an exploded perspective view of a plug connector of a second embodiment of the present invention;

FIG. 6A is an exploded perspective view of the plug connector of the second embodiment of the present invention of another type;

20       FIG. 7 is an exploded perspective view of a plug connector of a third embodiment of the present invention;

FIG. 8 is an exploded perspective view from another angle of the plug connector of the third embodiment of the present invention;

FIG. 9 is a perspective view of the plug connector of the third embodiment of the present invention;

FIG. 10 is a perspective view of the plug connector of the third embodiment of the present invention under another use condition;

FIG. 11 is an exploded perspective view of a plug connector of a fourth embodiment of the present invention;

5 FIG. 12 is an exploded perspective view from another angle of the plug connector of the fourth embodiment of the present invention;

FIG. 13 is a perspective view of the plug connector of the fourth embodiment of the present invention; and

10 FIG. 14 is a perspective view of the plug connector of the fourth embodiment of the present invention under another use condition.

## **DETAILED DESCRIPTION OF THE EMBODIMENTS**

15 Wherever possible in the following description, like reference numerals will refer to like elements and parts unless otherwise illustrated.

With reference to FIGS. 2 to 3, the present invention provides a plug connector for use in a standard transfer including an insulating housing 10, a plurality of terminals 20 and a transferring element 30. The insulating housing 10 is made of an insulating material, such as, for example, plastic. The inside of  
20 the insulating housing 10 is hollow. The insulating housing 10 has a tongue element 11 formed on an outer side thereof for hooking and positioning. The insulating housing 10 has a plurality of terminal grooves 12 equidistantly formed in a front end thereof. The terminal grooves 12 are in communication with the inside of the insulating housing 10. The insulating housing 10 includes

a plurality of slots 13 formed in two opposite sides of a middle position and a rear position thereof for positioning the transferring element 30.

Each of the terminals 20 is made of a conductive material, such as, for example, copper. The terminals 20 are respectively arranged in the terminal  
5 grooves 12. Each terminal 20 has a piercing end (not shown) for electrically connecting with a plurality of conductive lines 40.

The transferring element 30 is made of an insulating material, such as, for example, plastic. The transferring element 30 has a main body 31 and two arms 32. The main body 31 is substantially rectangular in shape. The width of  
10 the main body 31 is larger than that of the insulating housing 10. The main body 31 has a receiving opening 33 according to the width of the insulating housing 10. The two arms 32 can be integrally formed on two sides of the main body 31. Each arm 32 has two protrusions 34 respectively projecting inward from a front position and a rear position thereof. The two protrusions 34 are respectively  
15 hooked into the slots 13 at two sides of the insulating housing 10.

The transferring element 30 is coupled on the insulating housing 10 via the receiving opening 33. The transferring element 30 can be moveably adjusted at a predetermined position (such as a first position or a second position) on the insulating housing 10.

20 When the transferring element 30 is backward moved into the first position (shown in FIGS. 3 and 4), the protrusions 34 of the two arms 32 are respectively hooked into the slots 13 at the two sides of the middle position and the rear position of the insulating housing 10, thereby to define a positioning

mechanism. Thus the transferring element 30 can be securely positioned at a rear-half portion of the insulating housing 10.

When the transferring element 30 is forward moved in the second position (shown in FIG. 5), the protrusions 34 of the two arms 32 are  
5 respectively hooked into the slots 13 at the two sides of the middle position and two front edges of the insulating housing 10. Thus the transferring element 30 can be securely positioned at a front-half portion of the insulating housing 10.

The conductive lines 40 are extended into an inside of the insulating housing from a rear of the insulating housing. The outer layer of the conductive  
10 lines 40 are pierced by the piercing end of the terminal grooves 12, so that the terminals 20 can be electrically connected to the conductive lines 40.

In the present invention, the plug connector mainly provides a technical feature in that the transferring element 30 is moveably adjusted on the insulating housing 10 for use in being transferred to different standards. When the  
15 transferring element 30 is backward moved in the first position, the front-half portion of the plug connector can obtain a small standard, for insertion into a complementary jack connector with a smaller standard (shown in FIG. 4). When the transferring element 30 is moved forward into the second position, the transferring element 30 is coupled at the front-half portion of the insulating  
20 housing 10, so that the front-half portion of the plug connector has a larger width to obtain a large standard for insertion into another complementary jack connector with larger standard (shown in FIG. 5).

Furthermore, the present invention can enable the plug connector to obtain different size standards due to the movement of the transferring element

30, so that the insulating housing 10 with the single size standard can be transferred to two standards. The present invention also can be simultaneously applied in different standards of plug and inserted in different standards of jack. When a factory owner wants to manufacture different standards of plug, he  
5 doesn't need renew the molding to manufacture different sizes of insulating housing, thereby effectively reducing the manufacturing cost. Furthermore, standard transfer is extremely easy.

Additionally, referring to FIG. 6, the rear end of the insulating housing 10 can be coupled with a USB connector 50. The terminals 20 can be  
10 electrically connected to contacts of the USB connector 50. Thus the USB connector 50 can be defined as an adaptor. The USB connector 50 can be a female type (shown in FIG. 6) or male type of connector (shown in FIG. 6A). The USB connector 50 also can be replaced by a connector for another purpose, plug or jack.

15 Additionally, referring to FIGS. 7 to 10, the shapes and structures of the insulating housing 10 and the transferring element 30 also can provide different variations. The transferring element 30 can be coupled on the insulating housing 10, and the transferring element 30 can be moved between the first position and the second position (shown in FIGS. 9 and 10). This embodiment further  
20 includes a connector 60 made of a plastic material. The inside of the connector 60 can be penetrated by a plurality of conductive lines (not shown). The connector 60 has a plurality of line grooves 61. The conductive lines are inserted into the line grooves 61 from a rear end of the connector 60. The connector 60 is inserted from a rear end of the insulating housing 10, so that the

connector 60 and with the conductive lines 61 are extended into an inside of the insulating housing 10. The connector 60 is fastened in the inside of the insulating housing 10. Thus the connector 60 and the insulating housing 10 can be combined into one piece. The terminals 20 are pressed into the line grooves 61, so that the outer layer of the conductive lines can pierce through the piercing end of the terminals 20 for achieving an electrical connection.

Additionally, referring to FIGS. 11 to 14, the shapes and structures of the insulating housing 10 and the transferring element 30 also can obtain different variations. The transferring element 30 can be coupled on the insulating housing 10, and the transferring element 30 can be moved between the first position and the second position (shown in FIGS. 13 and 14). This embodiment mainly provides a protection element 62 formed at an outer side of the connector 60.

When the connector 60 and the insulating housing 10 are combined together, the protection element 62 is arranged on an outer of the tongue element 11 of the

insulating housing 10. The protection element 62 can prevent the tongue element 11 from being broken in collision or incautiously hooking other articles.

Furthermore, the lifetime of the tongue element 11 can be substantially increased. The connector 60 has a bulge 63 formed thereon. When the transferring element 30 is in the first position, it can be positioned via the bulge 63.

There has thus been described a new, novel and heretofore unobvious plug connector which eliminates the aforesaid problem in the prior art.

Furthermore, those skilled in the art will readily appreciate that the above description is only illustrative of specific embodiments and examples of the



invention. The invention should therefore cover various modifications and variations made to the herein-described structure and operations of the invention, provided they fall within the scope of the invention as defined in the following appended claims.